

**REMARKS**

Claims 1-17 are pending. By this Amendment, claims 1 and 13 are amended.

Reconsideration in view of the foregoing amendments and the following remarks is respectfully requested.

Applicant thanks Examiners Bui and Cuneo for the courtesies extended to Applicant's representative during the March 28, 2006 personal interview. The substance of the interview is incorporated in the remarks below.

During the interview, various reasons were given as to why the §103 rejections are in error. The Examiners asserted that a §102 rejection over the Ikeda reference may be applicable. The foregoing amendments are made in view of the Examiners' broad interpretation of certain claim terms, under which claim 1 allegedly would have been readable on the Ikeda reference.

**I. The Claims Define Patentable Subject Matter**

**A.** The Office Action rejects claims 1-9 and 12 under 35 U.S.C. §103(a) over U.S. Patent Application Publication No. US 2001/0012212 A1 ("Ikeda") in view of U.S. Patent No. 5,835,356 to Wieloch et al. ("Wieloch"). This rejection is respectfully traversed.

**1. Alleged "Through-Hole" Of Ikeda Is Not "For Mounting The Semiconductor Switching Element"**

Claim 1 recites, *inter alia*, that a board body has a through-hole for mounting the semiconductor switching element thereon. Examples of such a through-hole are shown by elements 22a and 22b in Fig. 4 of this application.

The Office Action asserts that element 31b of Ikeda corresponds to the "through-hole for mounting the semiconductor switching element" recited in claim 1. The Office Action asserts that elements 11a-11f or 51 correspond to the semiconductor switching element. However, it is clear from Figure 3 of Ikeda that the through-hole 31b has nothing to do with

the mounting switching elements 11a-11f or 51. Therefore, the Office Action is incorrect in its premise that Ikeda discloses a through-hole "for mounting the semiconductor switching element."

**2. The Switching Element Of Ikeda Is Not Mounted To Both A Conductive Pattern Constituting A Power Circuit And A Conductive Pattern Constituting A Control Circuit, And Modifying It To Do So Would Change The Principle Of Operation And/Or Would Destroy The Intended Use Of The Ikeda Device**

Claim 1 recites, *inter alia*, a conductive pattern constituting a control circuit, a conductive pattern constituting a power circuit, and that the semiconductor switching element is mounted to both of these conductive patterns. See, e.g., Fig. 4, in which an exemplary semiconductor switching element 30 is mounted to both a conductive pattern 26 constituting a power circuit, and a conductive pattern 24 constituting a control circuit.

In contrast, the switching element 51 of Ikeda is mounted only to conductive path 31a, which forms the control circuit 15 shown in Fig. 1 (see paragraph [0027]). The conductive path 32a shown in Fig. 3 forms the power circuit 13 shown in Fig. 1 (see paragraph [0028]). It is clear that the switching element 51 is not mounted to the conductive path 32a that forms the power circuit 15.

The switching elements 11a-11f also clearly do not mount to both a power circuit and a control circuit. (In fact, the analysis set forth in the Office Action fails when elements 11a-11f are considered as the "switching element," for the additional reason that they are not mounted to either of power circuit 13 or control circuit 15.)

Additionally, modifying the Ikeda device in such a manner that the switching element 51 (or 11a-11f) is mounted to both conductive patterns would appear to change the principle of operation, and/or render the device unsatisfactory for its intended purpose. Either of these results is unacceptable according to MPEP §2143.01, subsections V and VI.

**3. Wieloch Does Not Disclose "A Printed Circuit Board Having A Board Body, A Conductive Pattern Constituting The Power Circuit And Disposed On One Surface Thereof, And A Conductive Pattern Constituting The Control Circuit And Disposed On The Other Surface Thereof"**

The Office Action appears to assert that elements 280 and 209 of Wieloch correspond to conductive patterns, one mounted on one surface of a board 248 and the other mounted on the other surface of the board 248. This is not correct.

Specifically, element 209 is not disposed on a surface of the board 248. Therefore, the analysis set forth in the Office Action fails on this point as well.

Thus, even if the two references were combined, the combination would not result in the invention of claim 1 at least because neither reference discloses the structure or concept of a switching device mounted on both conductive patterns that are disposed respectively on opposite surfaces of a board body.

**4. The Alleged Motivation To Combine References Is Improper**

The Office Action asserts that the motivation to combine Ikeda and Wieloch would have been "for the purpose of saving space in the substrate module." This statement (a) is not supported by evidence, (b) fails to explain how Ikeda would be modified in a space-saving manner, and (c) is evidently based on an impermissible use of hindsight knowledge gained from Applicant's disclosure, as discussed in detail below.

First, the Office Action does not cite any evidence, such as specific teaching in the prior art, that would support the Office Action's assertion. It is well established that an assertion of obviousness must be supported by evidence, and that even if prior art references can be combined, that alone is not enough to support a holding of obviousness. The prior art must also suggest the desirability of the combination. See, e.g., MPEP §2143.01, subsection III. The Office Action simply has not identified any such evidence.

Second, the Office Action fails to explain how Ikeda would be modified in a space-saving manner. In fact, taken as a whole, Wieloch may suggest, if anything, the addition of features that would take more space, not less. The Office Action errs by failing to explain the precise proposed modification, and by failing to consider each reference in its entirety.

Third, Applicant's disclosure suggests the concept of space saving. See, e.g., page 2, last paragraph through page 3, second paragraph. The presence of this teaching in Applicant's disclosure, and the absence of such a teaching or recognition of such a feature or advantage in the applied art, combine as strong evidence that the Office Action has relied on an impermissible use of hindsight knowledge gained from Applicant's disclosure.

**5. Further Errors In The Office Action With Respect To Dependent Claims**

The dependent claims are allowable at least for their dependence on claim 1.

Additionally:

(a) Regarding claim 2, the Office Action is in error because the alleged motivation to combine, i.e., "to provide a strengthening of the printed circuit board," is clearly based on hindsight. Wieloch discloses no teaching of "strengthening" with respect to element 285. Furthermore, the Office Action has not pointed to any evidence that "strengthening" would have been recognized as desirable in the prior art in this context.

(b) Regarding claims 3 and 5, element 285 is required to be an insulative layer. See, e.g., col. 5, lines 18-21. Thus, it clearly would not have been obvious to make element 285 of an aluminum plate or an aluminum alloy plate. Additionally, if this rejection is maintained, Applicant requires that a reference be provided to support the "official notice."

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For any or all of the foregoing reasons, the rejection over Ikeda in view of Wieloch is improper and must be withdrawn.

**B.** The Office Action rejects claim 10 under 35 U.S.C. §103(a) over Ikeda in view of Wieloch, and further in view of U.S. Patent No. 5,928,004 to Sumida et al. ("Sumida"), and rejects claim 11 under 35 U.S.C. §103(a) over Ikeda in view of Wieloch, and further in view of U.S. Patent No. 6,049,468 to Learmonth. These rejections are respectfully traversed.

Neither Sumida nor Learmonth overcomes the above-noted deficiencies of Ikeda and Wieloch with respect to claim 1. Therefore, claims 10 and 11 are allowable at least for their dependence on claim 1. Withdrawal of these rejections is respectfully requested.

**C.** As discussed above, the Examiners asserted during the interview that a §102 rejection over Ikeda may be proper. However, despite the Examiners' interpretation of, e.g., the phrase "mounted" in claim 1, Ikeda clearly does not show that a portion of the semiconductor switching element is positioned within the through-hole. Without conceding that the Examiners' interpretation of "mounted" is correct or reasonable, Applicants have made this amendment to expedite prosecution.

## **II. The Restriction Requirement Should Be Withdrawn**

The Office Action makes final the restriction requirement. However, non-elected method claims 13-17 include all of the features of claim 1, which is allowable as discussed above. Accordingly, rejoinder and allowance of the method claims is requested in accordance with MPEP §821.04(b).

## **III. Conclusion**

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,



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